

CLAIMS

1. A header, comprising
2 a substrate made of an insulative material and having a plurality of through holes formed
therein extending between upper and lower sides of the substrate;
4 plating applied to the through holes to form conductive cylinders with upper and lower ends;
and
6 a plurality of pre-formed heat re-flowable bonding members attached to corresponding upper
and lower ends of the conductive cylinders.
2. The header of Claim 1 wherein the pre-formed heat re-flowable bonding members are
solder balls.
3. The header of Claim 1 wherein the pre-formed heat re-flowable bonding members are
shaped solder deposits.
4. The header of Claim 1 wherein the substrate has a C-shape including main portion
extending in a longitudinal direction and a pair of legs extending in a lateral direction.
5. The header of Claim 4 wherein conductive cylinders extend through both the main
2 portion and the legs of the substrate.
6. The header of Claim 1 wherein the solder balls are made of a 63-37 weight percent
alloy of tin and lead.
7. The solder ball header of Claim 1 wherein the substrate is formed of an FR-4 glass
2 filled epoxy.

2 8. The header of Claim 1 wherein the conductive cylinders are formed with a central
axially extending hole.

9. The header of Claim 9 and further comprising a plurality of plugs each filling the
central axially extending hole of a corresponding conductive cylinder.

2 10. The header of Claim 1 and further comprising at least one locator pin having a first
end secured in the substrate and a second end extending from the substrate for registration with a
locator hole in a circuit board.

11. A circuit board assembly, comprising:

an upper circuit board including a plurality of conductive elements formed on a surface
thereof;

a lower circuit board including a plurality of conductive elements formed on a surface thereof;

a header including a substrate made of an insulative material and having a plurality of through
holes formed therein extending between an upper side of the substrate and a lower side of the
substrate, and plating applied to the through holes to form conductive cylinders with upper and lower
ends; and

10 a plurality of pre-formed heat re-flowable bonding members attached to corresponding upper
and lower ends of the conductive cylinders and corresponding conductive elements of the upper and
lower circuit boards to mechanically and electrically connect the upper lower circuit boards in spaced
12 apart, substantially parallel relationship.

12. The assembly of Claim 11 wherein the header has a generally C-shaped configuration.

2 13. The assembly of Claim 11 wherein the conductive cylinders each have a hole formed
there through.

14. The assembly of Claim 11 wherein the conductive cylinders are solid throughout their
2 length.

15. The assembly of Claim 11 wherein each pre-formed heat re-flowable bonding member
2 comprises a solder ball.

16. The assembly of Claim 16 wherein each solder ball wraps around a side wall of a
2 corresponding conductive element and a side wall of an end of a corresponding conductive cylinder.

17. The assembly of Claim 11 wherein the conductive cylinders have holes therethrough
2 which are plugged by a pin.

18. The assembly of Claim 11 wherein the conductive cylinders have holes therethrough
which are plugged with a conductive epoxy.

19. The assembly of Claim 11 wherein the conductive cylinders each have upper and lower
disc-shaped end portions.

20. A circuit board assembly, comprising;

upper and lower generally planar circuit boards each formed with an array of conductive
elements, the circuit boards being mechanically and electrically interconnected in a substantially
4 spaced apart, parallel relationship by at least one solder ball header, the solder ball header including
an elongate substrate made of an insulative material having a plurality of spaced apart through holes,
6 each of the through holes having a conductive cylinder extending therethrough, each of the
conducting cylinders having upper and lower disc-shaped end portions, and a plurality of solder balls
8 each bonded to a corresponding opposing conductive cylinder end portion and conductive element,
the solder balls wrapping around vertical side walls of the conductive cylinder end portions and
10 conductive elements.